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| 10/629,614 | 07/30/2003 | Won-Youl Choi | 277/006 | 6106 |

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| EXAMINER | |
|---|---|
| SCHINDLER, DAVID M | |
| ART UNIT | PAPER NUMBER |
| 2862 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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| 3 MONTHS | 01/03/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/629,614 | CHOI ET AL. | |
| | Examiner | Art Unit | |
| | David Schindler | 2862 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,17-29 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,17-20 and 22-29* is/are rejected.

7)☒ Claim(s) *21 and 31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/17/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. This action is in response to the Request for Continued Examination filed 9/29/2006.

### *Response to Arguments*

2. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

With regard to section C. on page 2 of applicant's Remarks, the Examiner respectfully disagrees. Please see the 35 U.S.C. 112 rejection below.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 20, 22, 23, 24, and 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As to Claim 20,

The phrase "the second excitation coil portion winds around one of the bar-type portions of the first parallel of bar-type portions of the second soft magnetic core and the second pick-up coil portion winds around the other of the bar-type portions of the first

parallel pair of bar-type portions of the second soft magnetic core" on lines 8-12 appears to introduce new matter. Specifically, the use of the phrase "the first parallel pair" in the above phrase appears to be incorrect. Note that if the first excitation coil portion winds around one of the bar-type portions of the first parallel pair of bar type portions of the first magnetic core (lines 3-4 of claim 20), and if the first parallel pair of bar-type portions extend along the first axial direction (lines 2-3 of Claim 17), and given Applicant's Figures 5A-5F, then it appears that the second excitation coil portion winds around one of the bar-type portions of the second parallel pair of bar-type portions of the second soft magnetic core, and not the first parallel pair as claimed. Note that the second parallel pair of bar-type portions extends along the second axial direction (lines 3-4 of Claim 17), and that the second axial direction is perpendicular to the first axial direction (lines 10-11 of Claim 1).

As to Claims 22, 23, 24, and 25,

These claims contain a similar issue to that of the above rejected claim 20.

Due to the informal nature of the above claims, and art rejection is not provided for claims 22, 23, 24, and 25.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fedeli et al. (6,690,164) embodiment one (FE1) in view of Fedeli et al. (6,690,164) embodiment two (FE2) and Glowacki et al. (herein referred to as "Glowacki") (6,251,834) and Kawahito et al. (Kawahito) (JP 08-179023).

As to Claim 1,

FE1 discloses a first rectangular ring type core ((10a) in combination with (10b)) arranged lengthwise along a first axial direction (Figure 1A); a first excitation coil portion winding(12) around the first magnetic core; a first pick-up coil portion winding(14) around the first magnetic core; a second rectangular ring type magnetic core arranged lengthwise along a second axial direction, the second axial direction being perpendicular to the first axial direction; a second excitation coil portion winding around the second magnetic core; and a second pick-up coil portion winding around the second magnetic core; and dielectric substrate (16) ((Figures 1A and 1B) and (Column 1, Lines 66-67) and (Column 2, Lines 1-32)).

FE1 does not explicitly disclose that the cores are soft magnetic cores, and the first soft magnetic core is disposed on a first side of the dielectric substrate, the second soft magnetic core is disposed on a second side of the dielectric substrate.

FE2 discloses a soft magnetic core (FeNi) (Column 3, Line 7).

Glowacki discloses Feni has a greater tensile strength (Column 3, Lines 13-16).

It would have been obvious to a person of ordinary skill in the art to modify FE1 to include the cores are soft magnetic cores given the above disclosure and teaching of FE2 and Glowacki in order to have a core of greater tensile strength.

Kawahito discloses the first soft magnetic core is disposed on a first side of the dielectric substrate, the second soft magnetic core is disposed on a second side of the dielectric substrate ((Figure 1) and (Abstract, Constitution) / note cores on left side (first side) and right side (second side)).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the printed circuit board includes the first soft magnetic core is disposed on a first side of the dielectric substrate, the second soft magnetic core is disposed on a second side of the dielectric substrate. as taught by Kawahito in order to accurately detect magnetism with high sensitivity and extremely miniaturize a device (Abstract, Purpose).

As to Claim 17,

FE1 discloses each of the first and second soft magnetic cores includes a first parallel pair of bar-type portions extending along the first axial direction and a second parallel pair of bar-type portions extending along the second axial direction and the first

and second soft magnetic cores extend along a plane that is substantially parallel to the dielectric substrate, wherein each of the first and second soft magnetic cores serves as a closed magnetic path ((Figures 1A and 1B) and (Column 2, Lines 1-32)).

As to Claim 18,

FE1 discloses the first excitation coil portion separately winds around each bar-type portion of the first parallel pair of bar-type portions of the first soft magnetic core in a solenoid pattern extending along the first axial direction and the second excitation coil portion separately winds around each bar-type portion of the second parallel pair of bar-type portions of the second soft magnetic core in a solenoid pattern extending along the second axial direction ((Figures 1A and 1B) and (Column 2, Lines 1-32)).

As to Claim 19,

FE1 discloses the first pick-up coil portion winds around both bar-type portions of the first parallel pair of bar-type portions of the first soft magnetic core together in a solenoid pattern extending along the first axial direction, and the second pick-up coil portion winds around both bar-type portions of the second parallel pair of bar-type portions of the second magnetic core together in a solenoid pattern extending along the second axial direction ((Figures 1A and 1B) and (Column 2, Lines 1-32)).

As to Claim 20,

FE1 discloses along a plane substantially perpendicular to the dielectric substrate and the first axial direction, the first excitation coil portion winds around one of the bar-type portions of the first parallel pair of bar type portions of the first soft magnetic core and the first pick-up coil portion winds around the other of the bar-type

portions of the first parallel portions of the first soft magnetic core, and along a plane substantially perpendicular to the dielectric substrate and the first axial direction, the second excitation coil portion winds around one of the bar-type portions of the first parallel pair of bar-type portions of the second soft magnetic core ((Figures 1A and 1B) and (Column 2, Lines 1-32)).

8. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being obvious over Fedeli et al. (6,690,164) embodiment one (FE1) in view of Fedeli et al. (6,690,164) embodiment two (FE2) and Glowacki et al. (herein referred to as "Glowacki") (6,251,834) and Kawahito et al. (Kawahito) (JP 08-179023) and in further view of Choi et al. (herein referred to as "Choi") (6,411,086).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer

in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

As to Claim 26,

FE1 in view of FE2 and Glowacki and Kawahito discloses as explained above.

FE1 further discloses the first excitation coil portion winds around each bar-type portion of the first parallel pair of bar-type portions of the first magnetic core in a solenoid pattern extending along the first axial direction, and the second excitation coil portion winds around each bar-type portion of the second parallel pair of bar-type portions of the second soft magnetic core in a solenoid pattern extending along the second axial direction ((Figures 1A and 1B) and (Column 2, Lines 1-32)).

FE1 in view of FE2 and Glowacki and Kawahito does not disclose the first excitation coil portion alternately winds around each bar-type portion of the first parallel pair of bar-type portions of the first soft magnetic core in a figure-eight pattern extending along the first axial direction, and the second excitation coil portion alternately winds around each bar-type portion of the second parallel pair of bar-type portions of the second soft magnetic core in a figure eight pattern extending along the second axial direction.

Choi discloses winding an excitation coil in a figure-eight pattern (Column 4, Lines 38-55).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki and Kawahito to include the first excitation coil portion

alternately winds around each bar-type portion of the first parallel pair of bar-type portions of the first soft magnetic core in a figure-eight pattern extending along the first axial direction, and the second excitation coil portion alternately winds around each bar-type portion of the second parallel pair of bar-type portions of the second soft magnetic core in a figure eight pattern extending along the second axial direction given the above disclosure and teaching of Choi in order to have magnetic fluxes that are opposite to each other (Column 3, Lines 40-43).

As to Claim 27,

FE1 discloses the first pick-up coil portion winds around both bar-type portions of the first parallel pair of bar-type portions of the first soft magnetic core together in a solenoid pattern extending along the first axial direction, and the second pick-up coil portion winds around both bar-type portions of the second parallel pair of bar-type portions of the second magnetic core together in a solenoid pattern extending along the second axial direction ((Figures 1A and 1B) and (Column 2, Lines 1-32)).

As to Claim 28,

FE1 discloses the first pick-up coil portion winds around both bar-type portions of the first parallel pair of bar-type portions of the first soft magnetic core together in a solenoid pattern extending along the first axial direction, the second pick-up coil portion winds around both bar-type portions of the second parallel pair of bar-type portions of the second soft magnetic core together in a solenoid pattern extending along the second axial direction, the winding of the first pick-up coil portion is off-set from the winding of the first excitation coil portion, and the winding of the second pick-up coil

portion is off-set from the winding of the second excitation coil portion ((Figure 1A) and (Column 2, Lines 1-32)).

As to Claim 29,

FE1 discloses the first pick-up coil portion separately winds around each bar-type portion of the first parallel pair of bar-type portions of the first soft magnetic core in a solenoid pattern extending along the first axial direction and the second pick-up coil portion separately winds around each bar-type portion of the second parallel par of bar-type portions of the second soft magnetic core in a solenoid pattern extending along the second axial direction, the winding of the first pick-up coil portion is off-set from the winding of the first excitation coil portion, and the winding of the second pick-up coil portion is off-set from the winding of the second excitation coil portion ((Figures 1A and 1B) and (Column 2, Lines 1-32)).

***Allowable Subject Matter***

9. Claims 21 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is an examiner's statement of reasons for allowance:

As to Claim 21,

The primary reason for the allowance of claim 21 is the inclusion of the plurality of first upper portions of the first pick-up coil portion being electrically connected with the

plurality of corresponding first lower portions of the first pick-up coil portion by way of vias.. It is these features found in the claim, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

As to Claim 31,

The primary reason for the allowance of claim 31 is the inclusion of the first excitation coil portion is electrically connected to the second excitation coil portion by a via, and the first pick-up coil portion is electrically connected to the second pick-up coil portion by a via. It is these features found in the claim, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

## ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on M-F (8:00 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David Schindler
Examiner
Art Unit 2862

DS

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